

COURSE SYLLABUS

Course Title:	Programmable Logic Controllers	Date submitted:	May 2019 (AAC: 19-25)	
Department:	Advanced Manufacturing Technology			
Curriculum:	Technology Studies			
Course Descriptors: Make certain that the course descriptors are consistent with college and Board of Trustees policies, and the current course numbering system.	Course Code: (eg. ACC 101)	Prerequisites:		
	Course Type:	MFG*146	Math for Electricity & Electronics(MFG*133), Circuit Theory I (MFG*137), Digital Fundamentals (MFG*138), Circuit Theory II (MFG*139), and Robotics (MFG*140) or consent of the instructor	
	A: Clinical B: Lab D: Distance Learning I: Individual/Independent L: Lecture N: Internship M: Seminar P: Practicum U: Studio X: Combined Lecture/Lab Y: Combined Lecture/ Clinical/Lab Z: Combined Lecture/Studio	X		
	Elective Type:	G	Corequisites: None	
	AH: Art History E: English FA: Fine Arts FL: Foreign Language G: General HI: History HU: Humanities LAS: Liberal Arts & Sciences M: Math S: Science SS: Social Science	Credit Hours:		3
	Developmental: (yes/no)	No		Other Requirements: None
	Lecture:	1.5		
	Clinical:	0		
	Lab:	1.5		
	Studio:	0		
Other:	0			
TOTAL:	3			
Class Maximum:	24			
Semesters Offered:	Fall, Spring			
Catalog Course Description:	Programmable Logic Controllers provides you with an overview of the PLC, its hardware, numbering systems and codes, logic fundamentals, programming timers and counters, program control and data manipulation instructions, math instructions, sequencer and shift register instructions, and PLC installation, editing and troubleshooting.			
Topical Outline: List course content in outline format.	<ol style="list-style-type: none"> 1. Programmable Logic Controllers: An Overview 2. PLC Hardware Components & Number Systems and Codes 3. Fundamentals of Logic 4. Basics of PLC Programming 5. Developing Fundamental PLC Wiring Diagrams and Ladder Logic Programs 6. Programming Timers 7. Programming Counters 8. Program Control Instructions 			

	<ol style="list-style-type: none"> 9. Data Manipulation Instructions 10. Math Instructions 11. Sequencer and Shift Register Instructions 12. PLC Installation Practices, Editing, and Troubleshooting 13. Process Control and Data Acquisition 14. Computer-Controlled Machines and Processes
<p>Outcomes: Describe measurable skills or knowledge that students should be able to demonstrate as evidence that they have mastered the course content.</p>	<p>Upon successful completion of this course, the student will be able to do the following:</p> <ol style="list-style-type: none"> 1. The student will become familiar with the PLC system and its role in industry; and make comparisons with personal computers; as well as, develop an understanding of its origin and growth since conception. 2. Demonstrate an understanding of the hardware and the role of each major component making up a PLC system. 3. Demonstrate an understanding of several numbering systems utilized by a PLC system. 4. Demonstrate the understanding of digital logic gates and of the role Boolean algebra plays in writing digital gate diagrams. 5. Demonstrate the ability to design basic programming using ladder logic and demonstrate the understanding of basic principles involved in programming. 6. Develop PLC wiring diagrams and ladder logic programs. 7. Design, develop, and program a variety of timer instructions. 8. Design, develop, and program a variety of counter instructions. 9. Design, develop, and program a variety of control instructions. 10. Design, develop, and program data manipulation instructions. 11. Design, develop, and program math instructions. 12. Design, develop, and program sequencer and shift register instructions. 13. Perform PLC installations and troubleshoot PLC installations. 14. Demonstrate an understanding of process control and data acquisition systems. 15. Demonstrate an understanding of computer-controlled machines and processes.
	<p>PROGRAM: <i>Electronics Technology Certificate and A.S. Degree</i></p> <ol style="list-style-type: none"> 1. Demonstrate an understanding of Shop Safety. 2. Demonstrate an understanding the theory of electrical structure, voltage, current, resistance, and electrical circuit and their measurement. 3. Demonstrate an understanding of the basic laws of arithmetic. 4. Demonstrate an understanding of several number systems and codes that are the foundation of digital theory and digital applications. 5. Make comparisons with personal computers; as well as, develop an understanding of its origin and growth since conception. 6. Demonstrate an understanding of the fundamentals of Automated Manufacturing systems.

	<p>GENERAL EDUCATION: <i>(Numbering reflects General Education Outcomes as they appear in the college catalog)</i></p> <p>No General Education outcomes.</p>
<p>Evaluation: List how the above outcomes will be assessed.</p>	<p>Assessment will be based on the following criteria:</p> <ol style="list-style-type: none"> 1. Tests and quizzes
<p>Instructional Resources: List library (e.g. books, journals, on-line resources), technological (e.g. Smartboard, software), and other resources (e.g. equipment, supplies, facilities) required and desired to teach this course.</p>	<p>Required: Full electronics lab</p> <p>Desired: None</p>
<p>Textbook(s)</p>	<p><u>Programmable Logic Controllers</u>, Frank D. Petruzella, McGraw-Hill Publishers , latest edition</p>